

Taking ACIP Footnotes in Stride

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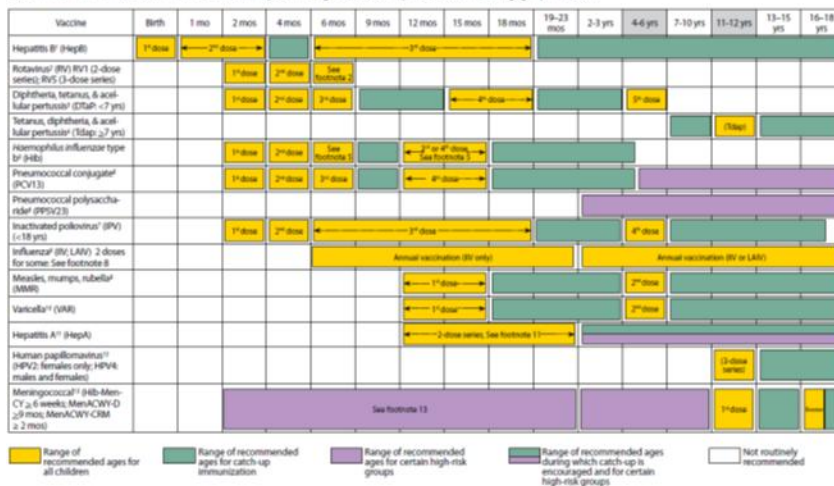
April 23 & 24, 2014

CDC Pediatric and Adult Schedules 2014

Figure 1. Recommended immunization schedule for persons aged 0 through 18 years – United States, 2014

(FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE (FIGURE 2))

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are in bold.



Recommended Adult Immunization Schedule—United States - 2014

Note: These recommendations must be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

Figure 1. Recommended adult immunization schedule, by vaccine and age group.

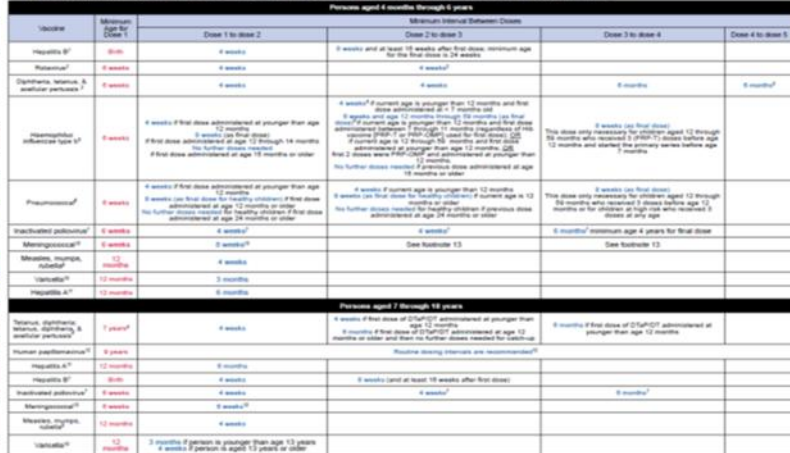
Vaccine	AGE GROUP	19-21 years	22-26 years	27-49 years	50-59 years	60-64 years	≥ 65 years
Influenza 1*		1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap) 1*		Substitute 1 dose of Tdap for Td booster; then boost with Td every 10 yrs.					
Tetella 1*		2 doses					
Human papillomavirus (HPV) Female 1*		3 doses					
Human papillomavirus (HPV) Male 1*		3 doses					
Zoster 1						1 dose	
Mexelin, mumps, rubella (MMR) 1*		1 or 2 doses					
Pneumococcal 13-valent conjugate (PCV13) 1*		1 dose					
Pneumococcal polysaccharide (PPSV23) 1,2		1 or 2 doses					1 dose
Meningococcal 1*		1 or more doses					
Hepatitis A 1*		2 doses					
Hepatitis B 1*		3 doses					
Adenovirus influenza type 1 (Hib) 1*		1 or 3 doses					

*Covered by the Vaccine Injury Compensation Program

<http://www.cdc.gov/vaccines/schedules/index.html>

FIGURE 2. Catch-up immunization schedule for persons aged 4 months through 18 years who start late or who are more than 1 month behind — United States, 2014

The figure below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. Always use this table in conjunction with Figure 1 and the footnotes that follow.



NOTE: The above recommendations must be read along with the footnotes of this schedule.

Figure 2. Vaccines that might be indicated for adults based on medical and other indications¹

VACCINE	INDICATION	Pregnancy	Immunocompromising conditions (including human immunodeficiency virus (HIV) ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100,101,102,103,104,105,106,107,108,109,110,111,112,113,114,115,116,117,118,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144,145,146,147,148,149,150,151,152,153,154,155,156,157,158,159,160,161,162,163,164,165,166,167,168,169,170,171,172,173,174,175,176,177,178,179,180,181,182,183,184,185,186,187,188,189,190,191,192,193,194,195,196,197,198,199,200,201,202,203,204,205,206,207,208,209,210,211,212,213,214,215,216,217,218,219,220,221,222,223,224,225,226,227,228,229,230,231,232,233,234,235,236,237,238,239,240,241,242,243,244,245,246,247,248,249,250,251,252,253,254,255,256,257,258,259,260,261,262,263,264,265,266,267,268,269,270,271,272,273,274,275,276,277,278,279,280,281,282,283,284,285,286,287,288,289,290,291,292,293,294,295,296,297,298,299,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,319,320,321,322,323,324,325,326,327,328,329,330,331,332,333,334,335,336,337,338,339,340,341,342,343,344,345,346,347,348,349,350,351,352,353,354,355,356,357,358,359,360,361,362,363,364,365,366,367,368,369,370,371,372,373,374,375,376,377,378,379,380,381,382,383,384,385,386,387,388,389,390,391,392,393,394,395,396,397,398,399,400,401,402,403,404,405,406,407,408,409,410,411,412,413,414,415,416,417,418,419,420,421,422,423,424,425,426,427,428,429,430,431,432,433,434,435,436,437,438,439,440,441,442,443,444,445,446,447,448,449,450,451,452,453,454,455,456,457,458,459,460,461,462,463,464,465,466,467,468,469,470,471,472,473,474,475,476,477,478,479,480,481,482,483,484,485,486,487,488,489,490,491,492,493,494,495,496,497,498,499,500,501,502,503,504,505,506,507,508,509,510,511,512,513,514,515,516,517,518,519,520,521,522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537,538,539,540,541,542,543,544,545,546,547,548,549,550,551,552,553,554,555,556,557,558,559,560,561,562,563,564,565,566,567,568,569,570,571,572,573,574,575,576,577,578,579,580,581,582,583,584,585,586,587,588,589,590,591,592,593,594,595,596,597,598,599,600,601,602,603,604,605,606,607,608,609,610,611,612,613,614,615,616,617,618,619,620,621,622,623,624,625,626,627,628,629,630,631,632,633,634,635,636,637,638,639,640,641,642,643,644,645,646,647,648,649,650,651,652,653,654,655,656,657,658,659,660,661,662,663,664,665,666,667,668,669,670,671,672,673,674,675,676,677,678,679,680,681,682,683,684,685,686,687,688,689,690,691,692,693,694,695,696,697,698,699,700,701,702,703,704,705,706,707,708,709,710,711,712,713,714,715,716,717,718,719,720,721,722,723,724,725,726,727,728,729,730,731,732,733,734,735,736,737,738,739,740,741,742,743,744,745,746,747,748,749,750,751,752,753,754,755,756,757,758,759,760,761,762,763,764,765,766,767,768,769,770,771,772,773,774,775,776,777,778,779,780,781,782,783,784,785,786,787,788,789,790,791,792,793,794,795,796,797,798,799,800,801,802,803,804,805,806,807,808,809,810,811,812,813,814,815,816,817,818,819,820,821,822,823,824,825,826,827,828,829,830,831,832,833,834,835,836,837,838,839,840,841,842,843,844,845,846,847,848,849,850,851,852,853,854,855,856,857,858,859,860,861,862,863,864,865,866,867,868,869,870,871,872,873,874,875,876,877,878,879,880,881,882,883,884,885,886,887,888,889,890,891,892,893,894,895,896,897,898,899,900,901,902,903,904,905,906,907,908,909,910,911,912,913,914,915,916,917,918,919,920,921,922,923,924,925,926,927,928,929,930,931,932,933,934,935,936,937,938,939,940,941,942,943,944,945,946,947,948,949,950,951,952,953,954,955,956,957,958,959,960,961,962,963,964,965,966,967,968,969,970,971,972,973,974,975,976,977,978,979,980,981,982,983,984,985,986,987,988,989,990,991,992,993,994,995,996,997,998,999,1000,1001,1002,1003,1004,1005,1006,1007,1008,1009,1010,1011,1012,1013,1014,1015,1016,1017,1018,1019,1020,1021,1022,1023,1024,1025,1026,1027,1028,1029,1030}
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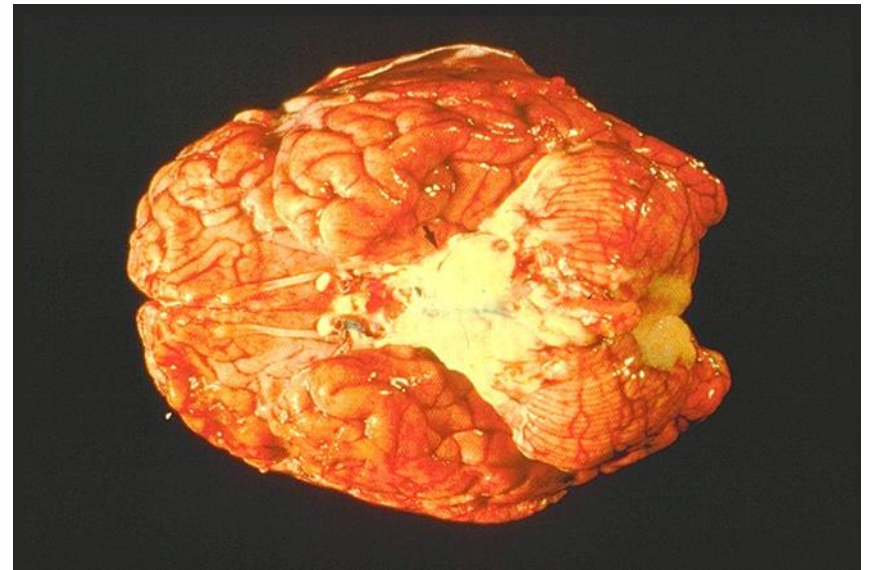
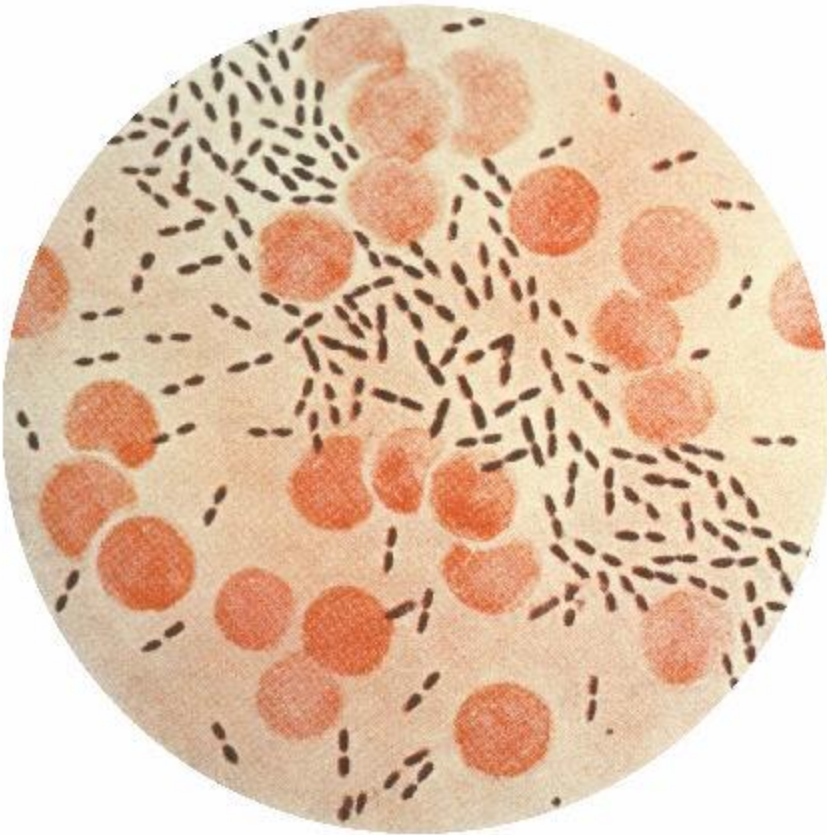
*Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection, zoster vaccine recommended regardless of prior episode of zoster

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

☐ No recommendation

Streptococcus pneumoniae



History of Pneumococcal Vaccines

- 1977: 14-valent polysaccharide vaccine
- 1983: 23-valent polysaccharide vaccine (PPSV23)
- 2000: 7-valent polysaccharide conjugate vaccine (PCV7)
- 2010: 13-valent polysaccharide conjugate vaccine (PCV13)

Groups at High Risk for *Streptococcus pneumoniae*

- Elderly
- Infants/young children
- Asplenia
- Sickle cell disease & hemoglobinopathies
- Native American/AN
- African American
- Child care attendance
- Long term care facility resident
- CSF leak
- Cochlear implant
- Immunocompromise
 - HIV
 - Congenital
 - Malignancy
 - Chemotherapy
 - Radiation therapy
 - Immunosuppressive drugs
 - Transplantation
- Chronic heart, lung, liver, renal disease
- Diabetes
- Smoking
- Alcoholism

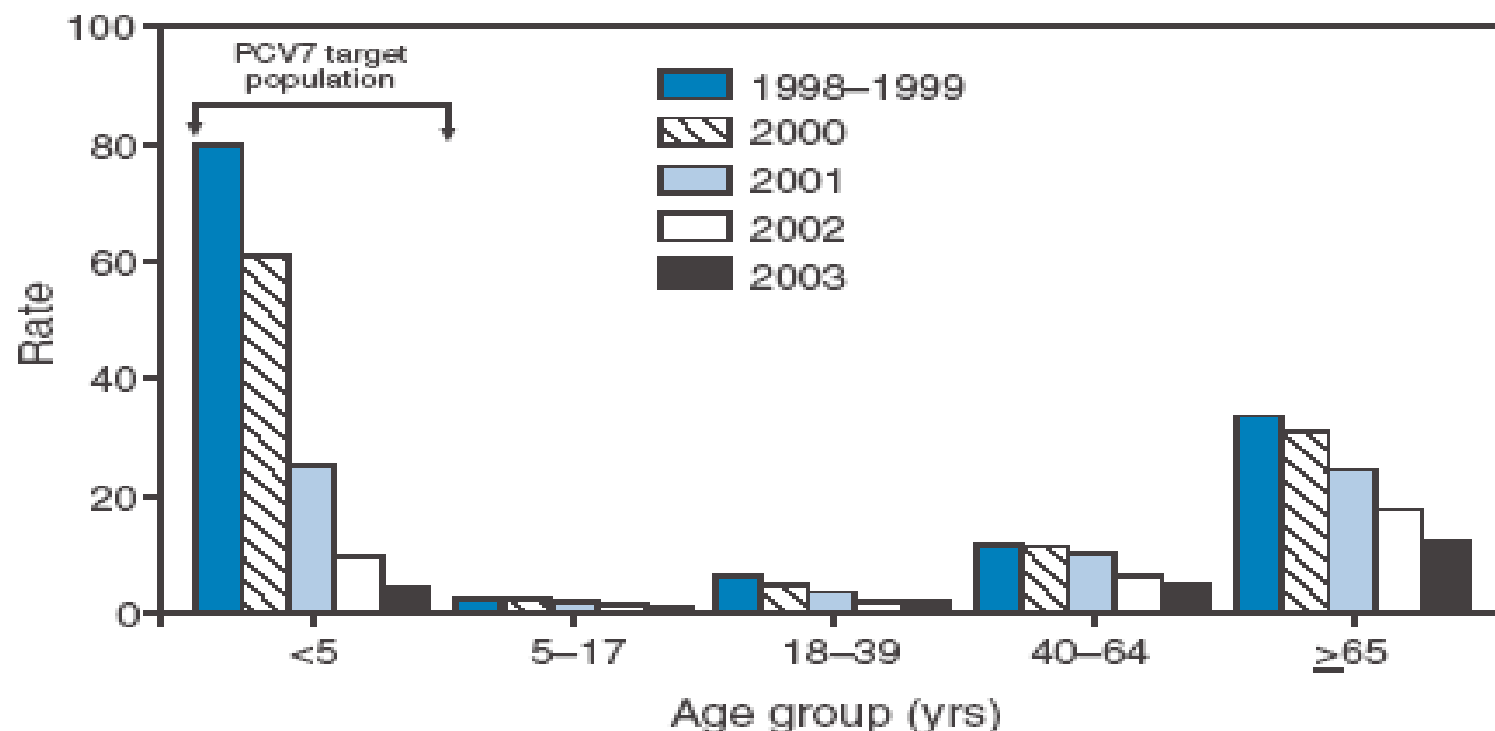
PPSV23 Vaccine in Adults

- One dose \geq 65 years old
- Use in High Risk younger adults
- One time PPSV23 revaccination after 5 years
 - HIV
 - Immunocompromised
 - Chronic renal failure
 - Nephrotic syndrome
 - Sickle cell anemia and other hemoglobinopathies
 - Asplenia
- PPSV23 when \geq 65 years and \geq 5 years since last PPSV23

Pneumococcal Vaccine Principles

- Polysaccharide vaccine poorly effective in children less than 2 years old
- Conjugate vaccine is more immunogenic for all
 - Effective in infancy
- High risk individuals benefit from both conjugate and polysaccharide vaccines
- More immunogenic if give conjugate before polysaccharide

FIGURE 1. Rate* of vaccine-type (VT) invasive pneumococcal disease (IPD) before and after introduction of pneumococcal conjugate vaccine (PCV7), by age group and year — Active Bacterial Core surveillance, United States, 1998–2003



* Per 100,000 population.

† For each age group, the decrease in VT IPD rate for 2003 compared with the 1998–1999 baseline is statistically significant ($p < 0.05$).

MMWR Sept. 16, 2005

**Invasive *S. pneumoniae*
in Arizona Children ≤ 5 y.o.
2008
(N=133)**

Vaccine	Vaccine Serotypes	Cases
Prevnar 7 (PCV7)	6B	1
	4, 9V, 14, 18C, 19F, 23F	0

Invasive *S. pneumoniae* ≤ 5 y.o. in AZ, 2008 (N=133)

Vaccine	Vaccine Serotypes	Cases
Prevnar 7 (PCV7)	6B	1
	4, 9V, 14, 18C, 19F, 23F	0
Prevnar 13 (PCV7 + six)	1	3
	3	1
	5	12
	6A	1
	7F	16
	19A	13

Invasive *S. pneumoniae* ≤ 5 y.o. in AZ, 2008 (N=133)

Vaccine	Vaccine Serotypes	Cases
Prevnar 7 (PCV7)	6B	1
	4, 9V, 14, 18C, 19F, 23F	0
Prevnar 13 (PCV7 + six)	1	3
	3	1
	5	12
	6A	1
	7F	16
	19A	13
Pneumovax 23 (PCV13 without 6A + eleven)	8	1
	12F	1
	15B	2
	2, 9N, 10A, 11A, 17F, 20, 22F, 33F	0

Schedule for PCV13 Vaccines

- Minimum age
 - 6 weeks
- Four doses
 - 2, 4, 6 months and 12-15 months
- Fewer total PCV13 doses if the start of PCV13 dosing is delayed

Pneumococcal Conjugate Vaccine (PCV-13) Schedule for Older Unimmunized Children

Age at 1 st Dose	Primary Series	Booster
7-11 months	2 doses	Yes*
12-23 months	2 doses*	No
24-59 months, healthy	1 dose	No
24-71 months, medical conditions	2 doses*	No

*separated by at least 8 weeks

MMWR. 2010: 59 (RR-11), 1-19

Broadening High Risk Pediatric Pneumococcal Coverage

- High risk children need both PCV-13 and PPSV-23
 - HIV and other immunocompromising conditions
 - Functional or anatomic asplenia, including sickle cell disease
 - Cochlear implant or CSF leak
- After PCV-13 in infancy, give PPSV23 at ≥ 2 years old
 - Then 2nd PPSV23 in ≥ 5 years for
 - HIV and other immunocompromising conditions
 - Functional or anatomic asplenia, including sickle cell disease
 - No more PPSV23 until 65 years old
- Unimmunized high risk 6 -18 years:
 - One dose PCV-13 and in ≥ 8 weeks, give PPSV-23

MMWR June 28, 2013

PCV13 for High-Risk Adults 19-64 yo

- If not previously received PCV13 or PPSV23
 - PCV13 followed in ≥ 8 weeks by PPSV23
 - If previous PPSV23, follow in 1 year by PCV13
- High Risk adults
 - Immune compromised* and HIV*
 - Chronic renal failure* and nephrotic syndrome*
 - Asplenia* & sickle cell disease*
 - CSF leak or cochlear implants

*Repeat PPSV23 in 5 years

MMWR. October 12, 2012

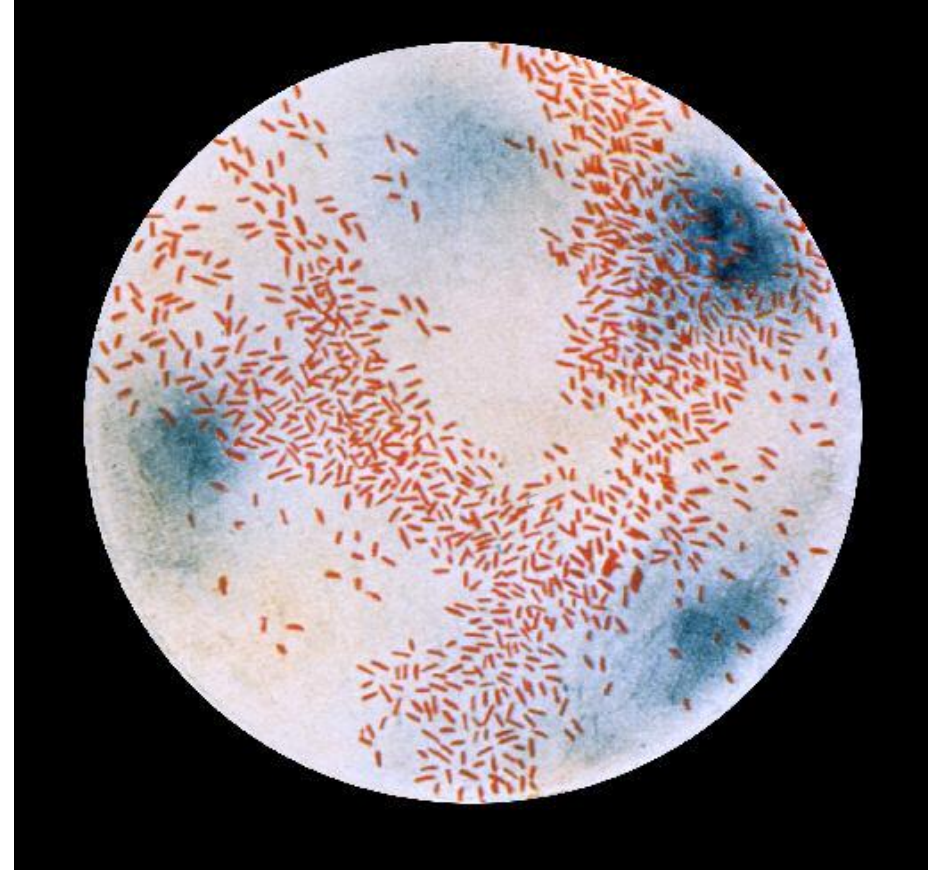
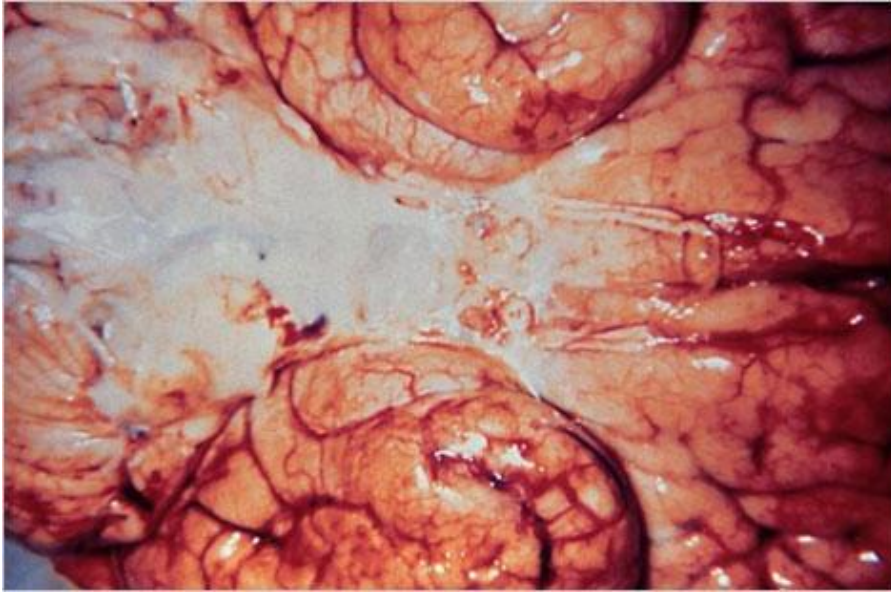
Prospective Pneumococcal Protection

- Give pneumococcal vaccine(s), Hib, and MCV4 before:
 - Elective splenectomy
 - Cochlear implant
 - Immunosuppressive therapy
- Best to give at least 2 weeks for antibody response
- Optimally PCV13 before PPSV23

Summary of High Risk Patients

- PCV13 infancy or ASAP
- PPSV23 when ≥ 2 years old
- Need both PCV13 and PPSV23
- PCV13 before PPSV23 when possible
- Repeat PPSV23 once in 5 years
 - HIV
 - Immune suppression
 - Chronic renal failure
 - Nephrotic syndrome
 - Sickle cell disease, etc.
 - Asplenia
- Final PPSV23 at ≥ 65 years old

Haemophilus influenzae type b (Hib)



US & Hib	Early 1980s	2007
Cases	~20,000	202
Meningitis	~10,000	N/A

Risk Factors for Invasive Hib Disease

- Infants
- Children under 5 years old
- American Indian/Alaska Native
- Sickle cell disease
- Functional or anatomic asplenia
- HIV infection
- Chemotherapy or radiation therapy for malignancy
- Immunoglobulin deficiency including IgG2 subclass deficiency
- Early component complement deficiency
- Receipt of hematopoietic stem cell transplant

MMWR. February 28, 2014

Invasive Hib in < 5 y.o. Children

Rate per 100,000

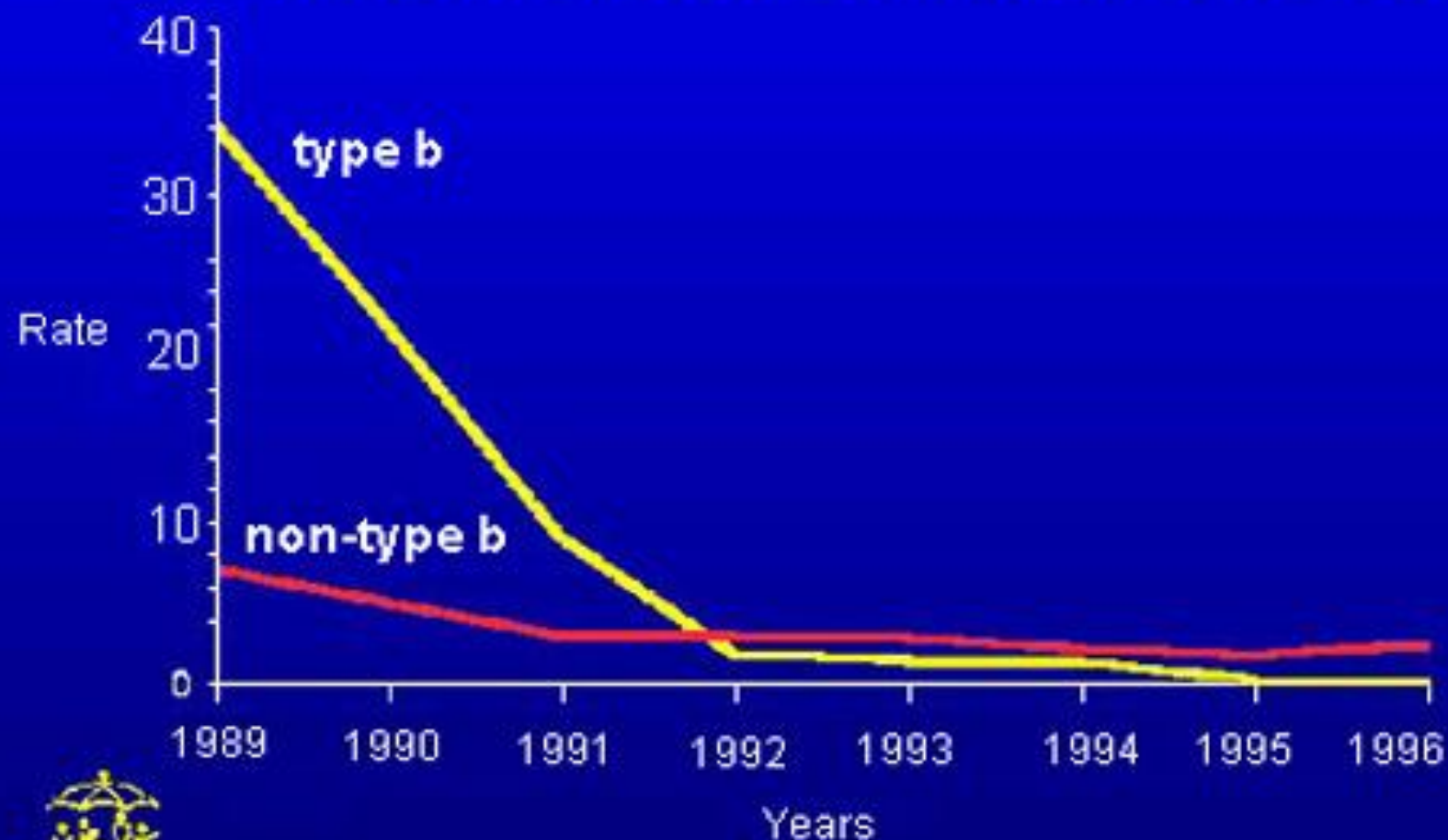
	Before Vaccination	After Vaccination	Postvaccine Rate Year
United States	60-100	0.3	1996
Alaskan Native	601	5.4	2001-2004
White Mountain Apache	250	22	1992-1999
Navajo	152	22	1992-1999

Singleton Arch Pediatr Adolesc Med May 2009

Development of Hib Vaccines

- Hib polysaccharide vaccine 1985-1988
 - 18 months-4 years old
- Hib conjugate vaccine 1987
 - Effective in infancy
 - Type of conjugation
 - Hib—Neisseria outer membrane protein
 - 2 doses infancy & booster
 - More effective in Native American
 - Hib—tetanus: 3 doses infancy & booster

Haemophilus influenzae* type b (Hib) and non-type Invasive Disease, per 100,000 Population, United States, 1989-1996



*For children aged <6 years; calculated from four active laboratory-based surveillance areas.

© CDC

Different Hib Vaccines

- 6 weeks – 4 years
 - PRP-OMP:
 - PedvaxHIB
 - COMVAX (Hib-HepB)
 - PRP-T:
 - Pentacel (DTap-IPV/Hib)
 - MenHibrix (MenCY-Hib)
- 15 months – 4 years (package insert)
 - Hiberix (PRP-T)
 - Final dose during 12 mo-4 years for child who had at least one previous Hib dose

Vaccination Schedule for Hib

Vaccine	Age at 1 st Dose	Primary Series	Booster
PRP-T	2-6 mos	3 doses, 8 wks apart	12-15 mos*
	7-11 mos	2 doses, 8 wks apart	12-15 mos*
	12-14 mos	1 dose	8 weeks later
	15-59 mos	1 dose	---
PRP-OMP	2-6 mos	2 doses, 8 wks apart	12-15 mos*
	7-11 mos	2 doses, 8 wks apart	12-15 mos*
	12-14 mos	1 dose	8 weeks later
	15-59 mos	1 dose	---

CDC Pink Book, 12th edition and CDC Schedule 2014

* \geq 8 weeks after previous dose

5-18 Year Olds who Need One Dose of Hib Vaccine

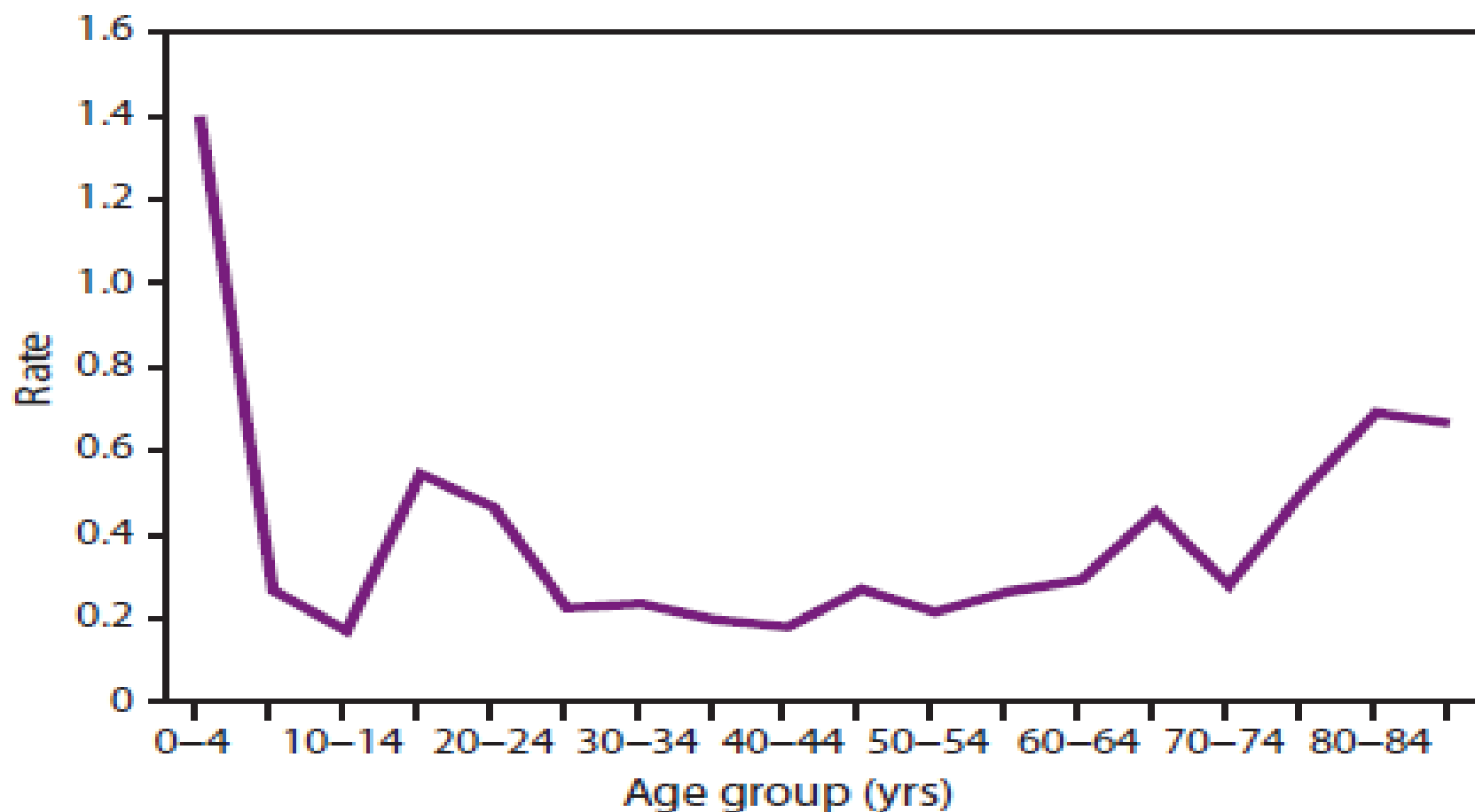
- Not fully immunized against Hib
 - Definition
 - Lacking primary series & booster, or
 - Lacking booster \geq 15 months
- Give to children ages 5-18 years old
 - HIV-infected
 - Anatomic or functional asplenia, including sickle cell disease

MMWR. Feb. 28, 2014

Neisseria meningitidis



FIGURE 2. Rate* of meningococcal disease, by age group — United States, 2002–2011[†]



MMWR. March 22, 2013

High Risk for Meningococcal Disease

- Infants
- Adolescents
- Asplenia, including sickle cell disease
- Complement component deficiency
- Travel to meningococcal endemic area
- Microbiologists working with *N. meningitidis*
- Military recruits
- Local outbreaks

Meningococcal Vaccines

- Quadrivalent (serogroups A, C, Y, W135)
 - Polysaccharide
 - Menomune ≥ 2 yrs old
 - Conjugated
 - Menactra (MCV4) 9 mos-55 yrs
 - Menveo (MCV4) 2 mos-55 yrs
 - MenHibrix (Hib-MenCY) 6 wks-18 mos

Routine Adolescent Meningococcal Vaccine

Primary	Booster
11-12 yo	16 yo
13-15 yo	16-18 yo
≥ 16 yo	---

HIV-infected adolescents need
a 2-dose primary series, ≥ 2 months apart

Menveo for High Risk Patients

- Four doses
 - 2, 4, 6 months with booster at 12 months
- Two doses
 - If start 7-23 months
 - 2nd dose after 12 months and ≥ 3 months after 1st
 - Start ≥ 2 years old
 - Two doses, ≥ 2 months apart
- One dose
 - Traveler to endemic area ≥ 2 years old to 55 years

Menactra for High Risk Patients

- Do not give Menactra to child with asplenia or sickle cell disease until ≥ 2 years old and at least 4 weeks after last pneumococcal vaccine
- 9-23 months: Two doses, ≥ 3 months apart
- ≥ 2 years old: Two doses, ≥ 2 months apart
- Traveler to endemic area:
 - 9-23 months: Two doses
 - ≥ 2 years old to 55 years old—One dose

MenHiberix (Hib-MenCY) for High Risk Patients

- 2, 4, 6 months with booster 12-15 months
 - Fourth dose can be given as late as 18 months
 - If 1st dose given ≥ 12 months, 2 doses ≥ 8 weeks apart
- Does not fulfill requirement for travel to African meningitis belt or pilgrimage to the Hajj

Menomune

- Polysaccharide licensed in 1978
- Serogroups A, C, Y, W135
- Licensed ≥ 2 years old
- MCV4 preferred when multiple doses needed and MCV4 previously received
- Use Menomune ≥ 56 years old
 - Single dose for travel
 - Other one-time need

Repeating Meningococcal Vaccine

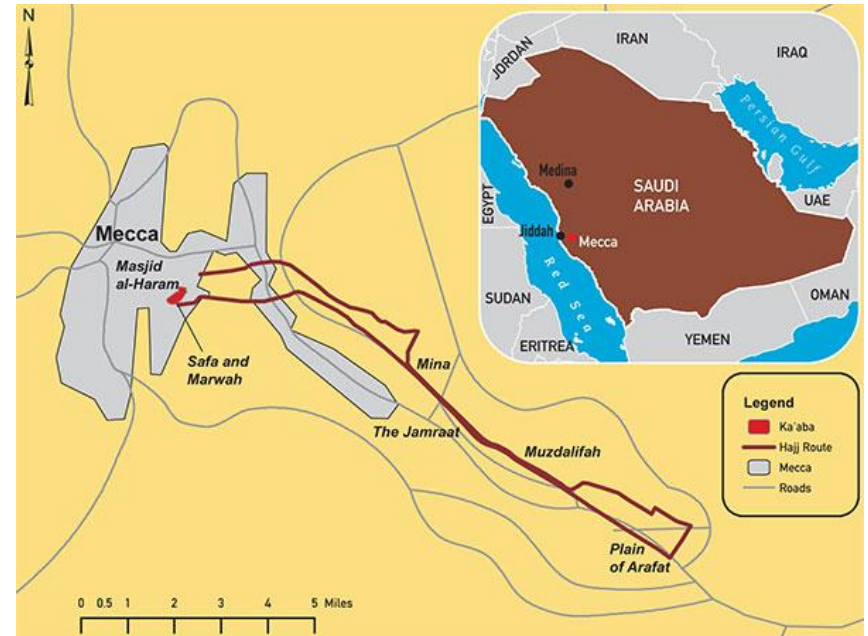
If risk persists:

- 1st dose(s) **2 mo – 6 yo**
- F/U vaccine in **3 yrs** → then every **5 yrs**
- 1st dose(s) **≥ 7 yo**
- F/U vaccine in **5 yrs** → then every **5 years**

Countries at Higher Risk for Meningococcal Disease



Meningitis Belt
CDC Yellow Book 2012



Hajj Pilgrimage
Oct. 2-7, 2014

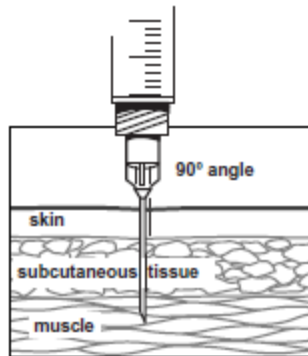
Meningococcal Vaccines & Hajj

- Proof of vaccine needed for visa
- Vaccine required within 3 years & not less than 10 days
- Children ≥ 2 yo and adults
 - Quadrivalent A/C/Y/W-135
- Infants 3 mo-23 months
 - Monovalent A
 - » 2 doses, with a 3 month interval between doses

Types of Influenza Vaccines

Inactivated

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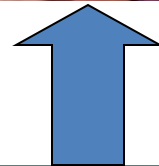
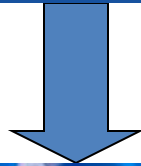
Intradermal

Live Attenuated



Intranasal

Egg-Based Influenza Vaccine Process



Licensed Influenza Vaccines for Children and Adults as of April 2014

Manufacturer	Trade Name	Ages	Abbreviation
Newly licensed			
Medimmune	FluMist Quadrivalent	2-49 ys healthy	LAIV4
GSK	Fluarix Quadrivalent	≥ 3 years	IIV4
Sanofi Pasteur	Fluzone Quadrivalent	≥ 6 months	IIV4
Previously licensed			
Medimmune	FluMist	2-49 yrs healthy	LAIV3
CSL	Afluria	≥ 9 years	IIV3
GSK	Fluarix	≥ 3 years	IIV3
Novartis	Fluvirin	≥ 4 years	IIV3
Sanofi Pasteur	Fluzone	≥ 6 months	IIV3

Influenza Vaccines for Adults as of April 2014

Manufacturer	Trade Name	Ages	Abbreviation
Newly Licensed			
Novartis	Flucelvax	≥ 18 yrs	cclIV3
Protein Sciences	FluBlok	18-49 yrs	RIV3
Previously Licensed			
GSK	FluLaval	≥ 18 yrs	IIV3
Novartis	Agriflu	≥ 18 yrs	IIV3
Sanofi Pasteur	Fluzone Intradermal	18-64 yrs	IIV3
Sanofi Pasteur	Fluzone High Dose	≥ 65 yrs	IIV3

FLUCELVAX (ccIIV3)

- Viruses need to grow in cells
- Influenza viruses grown in dog kidney cells
- Liquid nutrients keep cells alive
- Harvest influenza virus and create trivalent vaccine



FLUBLOK (RIV3)

Made by Recombinant Technology

- Genetic material for influenza hemagglutinin inserted into a moth virus' genetic material
- Moth virus added to continuously growing cells from fall armyworm
- Influenza hemagglutinin produced and harvested



Fall Armyworm



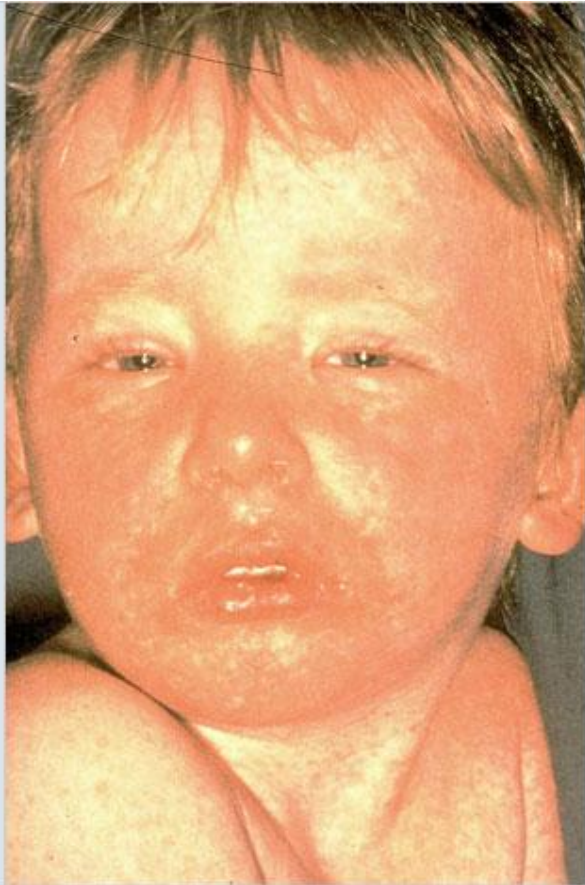
www.ars.usda.gov

Influenza Vaccines

if Person Has a History of Egg Allergy

Trade Name	Abbreviations	Reaction to Eggs	
		Mild to Moderate	Severe
		Can Receive Influenza Vaccine?	
FluMist	LAIV4	No	No
Flublok	RIV3	Yes	Yes
Flucelvax	cclIV3	Yes but watch 30"	No
All other influenza vaccines	IIV3 & IIV4	Yes but watch 30"	No

Complications of Measles



Measles in US 1985-1992	
%	Complications
8	Diarrhea
7	Otitis media
6	Pneumonia
0.6-0.7	Seizures
0.1	Encephalitis
0.2	Death

Congenital Rubella Complications

- Deafness
- Cataracts
- Retinitis
- Heart defects
- Microcephaly
- Mental retardation
- Skin rash



Complications from Mumps



Illness	Frequency
CNS disease	15% clinical cases
Orchitis	20-50% post pubertal males
Pancreatitis	2-5%
Deafness	1/20,000
Death	~1/year (1980-1999)

Children and MMR

- Two doses
 - 1st dose \geq 12 months
 - 2nd dose 4-6 years
- Minimum time between dose 1 & 2
 - Four weeks
- Lower age decreases to 6 months
 - International travel
 - Exposure to measles (within 72 hours)

Adults & Measles Vaccine

- Born before 1957—presumed immune
 - Health care providers should get 2 MMRs
- Born \geq 1957: 1 dose MMR
 - 2nd dose for HCPs, international travel, attending postsecondary educational institution
- Provider diagnosis of measles, mumps, or rubella is not acceptable

Measles Postexposure Prophylaxis for Nonimmune

- MMR within 72 hours of exposure
 - Ages \geq 6 months and immunocompetent
- Immune globulin within 6 days of exposure
 - Infants (0-11 months)
 - IGIM 0.5 mL/kg (max 15 mL) both immune competent and immune compromised
 - Pregnant and severely immune compromised
 - IGIV 400 mg/kg

Immunity to Rubella and Mumps

Rubella

- Born before 1957 unless female of childbearing age
- Single dose of rubella vaccine
 - 3 maximum doses
- Positive serology
- Laboratory confirmation of disease
- Health care provider rubella diagnosis is not valid

Mumps

- Born before 1957
- Positive serology
- Laboratory confirmation of disease
- One dose MMR
 - Preschool or low risk adult
- Two doses of MMR for
 - International travel
 - Health care provider
 - Student in postsecondary educational institution

Varicella



Immunity to Varicella

- Two documented varicella vaccines
- Laboratory evidence of antibodies or disease
- History of zoster based on health-care provider's diagnosis
- Verification of typical disease by health-care provider
- Born in US before 1980
 - Exemptions: pregnancy, immune suppressed, HCP

Varicella Vaccine

- 2 doses
 - Minimum intervals
 - ≥ 13 years: 1 month
 - 1 year-12 years: 3 months
- If pregnant woman with varicella 5 days before-2 days after delivery, infant must receive VariZIG

Interactions of Live Vaccines

- Give on same day or 4 weeks apart
 - MMR, Varicella, LAIV
- Oral live vaccines do not have to have spacing intervals from other live vaccines
 - Rotavirus
 - Oral typhoid
 - Oral polio

CDC. Pink Book. 12th edition.

Shingles

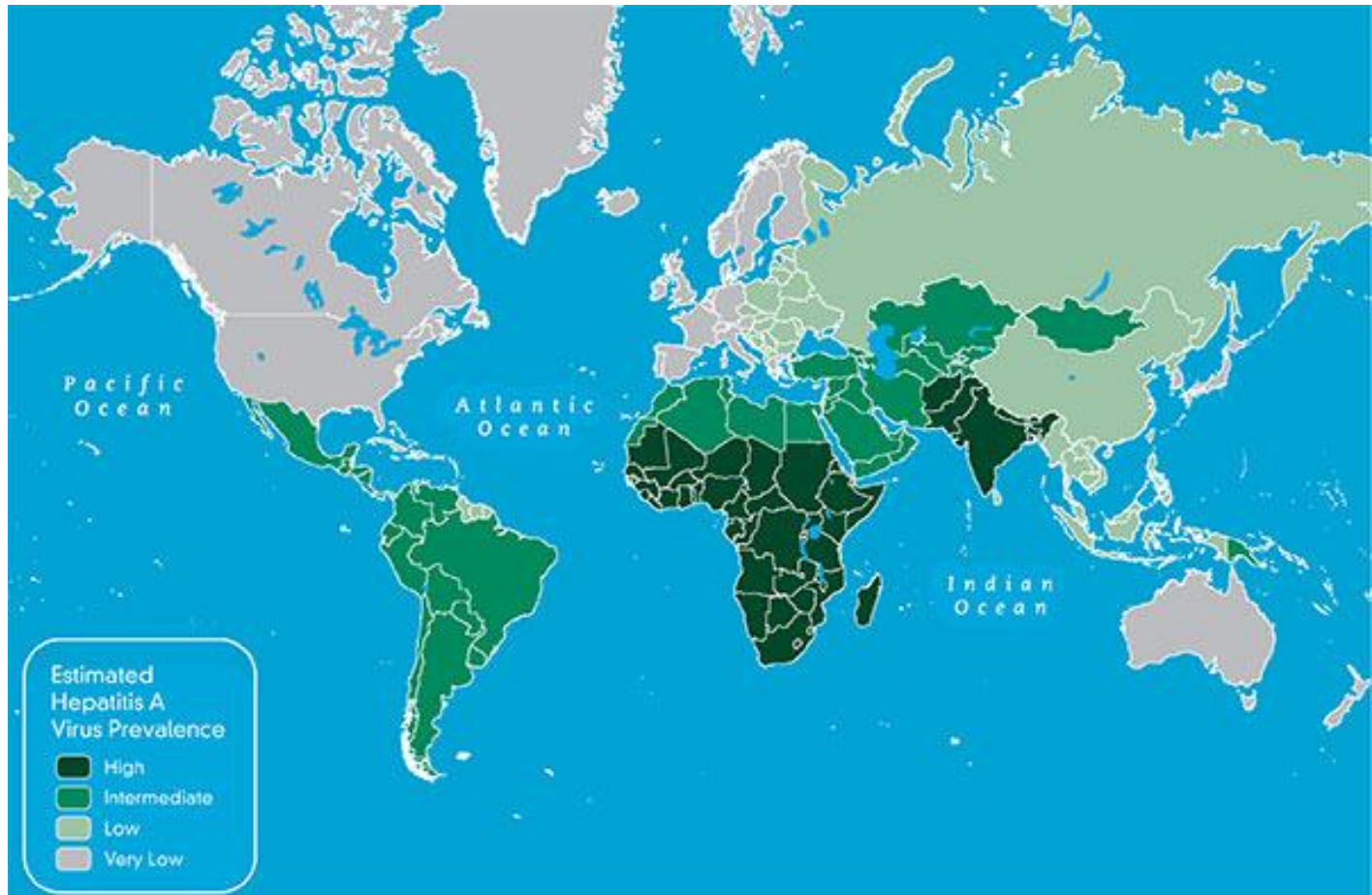
(Reactivation of Varicella Zoster Virus)



Zoster Vaccine

- 14 times the varicella virus as chicken pox vaccine
- No need to check varicella antibody status before giving
- Contraindicated in immunodeficiency, pregnancy, anaphylaxis to: gelatin, neomycin, zoster vaccine
- FDA licensed ≥ 50 years old
 - ACIP recommends ≥ 60 years old

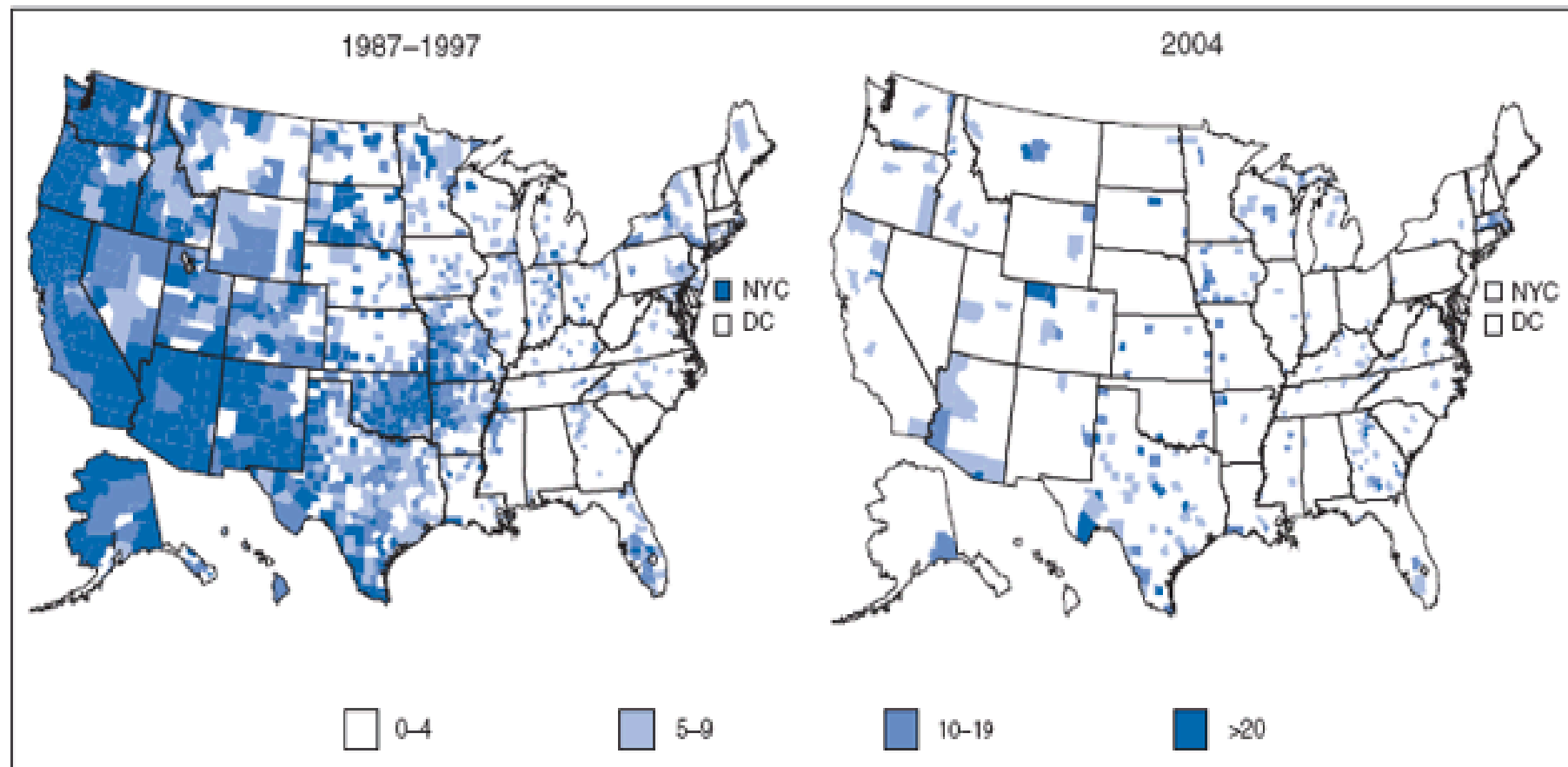
Hepatitis A Prevalence



www.cdc.gov

Decline in Hepatitis A with Vaccination

FIGURE 3. Rate* of hepatitis A, by county — United States, 1987–1997 and 2004



SOURCE: National Notifiable Diseases Surveillance System.

* Per 100,000 population.

MMWR May 19, 2006

Hepatitis A Vaccination

- Children 12-23 months
 - Routine
 - 2 dose
 - 2nd dose 6-18 months after 1st
- Give to older children if protection desired
- Give to the high risk

High Risk for Hepatitis A

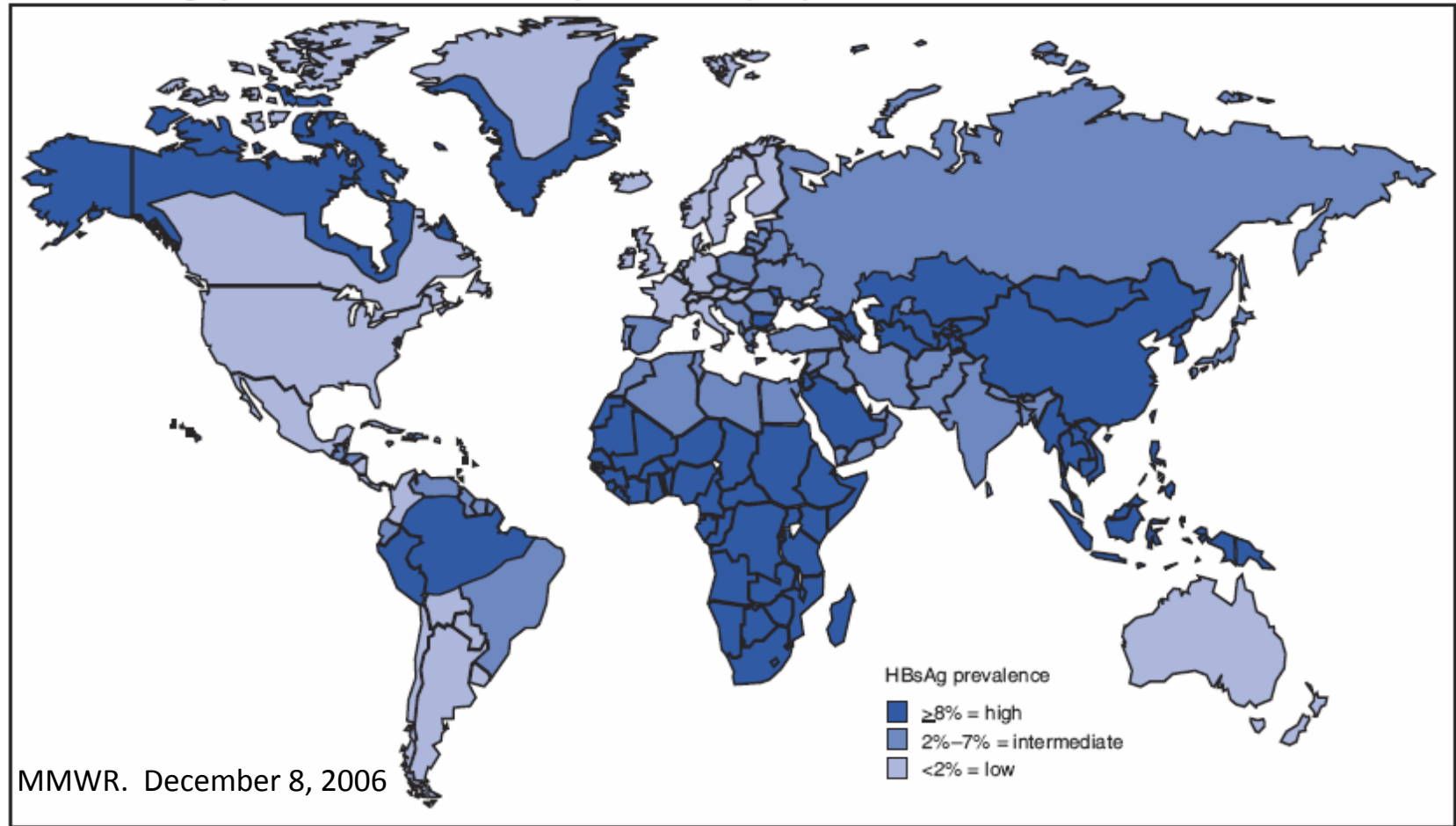
- Travel or work where intermediate or high
- Close contact with international adoptee within 60 days of arrival from higher risk area
- Injection and non-injection illicit drug use
- Clotting-factor disorders
- Chronic liver disease
- MSM
- Work with Hepatitis A infected primates/lab

Hepatitis A Vaccines

- Havrix or Vaqta: 0, 6-18 months
 - Peds and adult formulations
- Twinrix (A & B): Ages ≥ 18 years
 - 0, 1, 6 months
 - 0, 7 days, 21-30 days, 12 months
- Havrix or Vaqta can be used as postexposure prophylaxis within 2 weeks for ages 1 yr-40 yo
- Use IGIM (0.02 mL/kg) for < 1 yo, > 40 yo, underlying medical conditions

Chronic Hepatitis B Infection, 2005

FIGURE 4. Geographic distribution of chronic hepatitis B virus (HBV) infection — worldwide, 2005*



Risk Factors for Hepatitis B

- > 1 sex partner in 6 mos
- STD evaluation or Rx
- MSM
- HIV infected
- Injection drug users
- Correctional facilities
- Facilities for care of developmental disabilities
- Health care personnel
- Public safety workers
- Diabetics < 60 yo
- Chronic hemodialysis
- End stage renal disease
- Chronic liver disease
- Travelers to countries with high or mod HepB

Hepatitis B Formulations

- Monovalent
 - Recombivax & Engerix B
- Pediatric/Adol & Adult & Dialysis
- Twinrix (A & B)
- Combination (peds)
 - Comvax (Hib-HepB)
 - Pentacel (DTaP-IPV-HepB)
- Standard dosing
 - 0, 1-2, 6 months
- Alternate dosing
 - 0, 1-2 mo, 4 mo
- Infancy: Min age for 3rd dose
 - 24 weeks
- Twinrix (A & B)
 - 0, 1 mo, 6 mo
 - 0, 7d, 21-30 d, 12 mo
- 11-15 yo using Merck adult formulation: 0, 4-6 mo

Preventing Perinatal Hepatitis B

Mother's HBsAg at Birth	Infant	Needed Actions	Other
Positive	Any weight	HBIG and HBV vaccine within 12 hours of birth	Finish vaccine series ASAP, then check HBsAg and anti-HBsAf
Negative	Any weight	HBV vaccine before discharge	Finish series
Unknown	< 2 kg	HBIG <u>and</u> HBV vaccine within 12 hours of birth	Check mother's HBsAg ASAP. Don't count 1 st dose Finish series
Unknown	≥ 2 kg	HBV within 12 hours of birth	Check mother's HBsAg ASAP
		If mom HBsAg positive, give HBIG ASAP, up to 7 days	Finish series ASAP

Serology after Hepatitis B Vaccine Needed if...

- Infant born to hepatitis B infected mother
- Health care provider
- Hemodialysis patient
- HIV infected
- Immune compromised
- Sex partner of person chronically infected with hepatitis B



Vaccines and Pregnancy

Contraindicated

- Live, attenuated
 - MMR
 - Varicella
 - Zoster
 - LAIV
 - Oral typhoid
- Inactivated
 - HPV

Give if Needed

- Influenza
- Tdap
- PCV13
- PPSV23
- Hib
- MCV4
- IPV
- Hepatitis A or B

Contraindications to Vaccines

- Anaphylaxis to previous dose or vaccine component
- Moderate to severe illness
- Live vaccines: Immune compromise or pregnancy
- Child who developed encephalopathy without another explanation within 7 days of pertussis-containing vaccine

Precautions

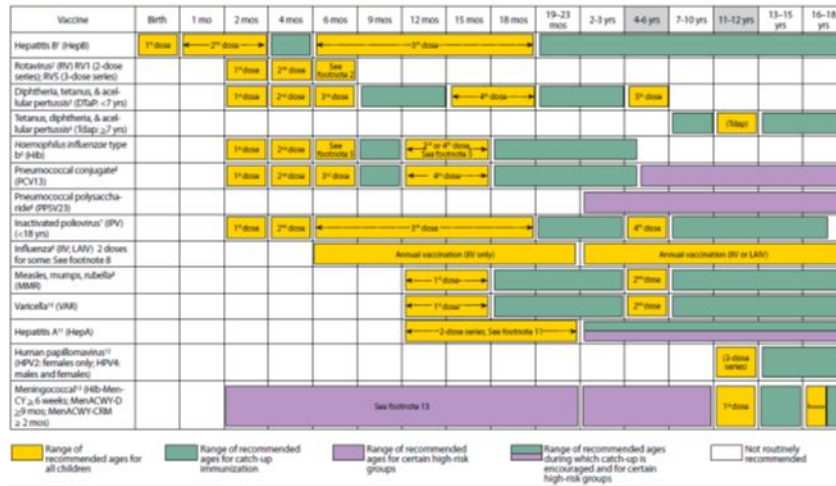
- MMR or VZ and recent immune globulin or antibody-containing blood product
- Guillain-Barré Syndrome within 6 weeks of influenza or tetanus-containing vaccine
- Mild reaction to eggs (influenza vaccines)
- Antiviral therapy (influenza & varicella)
- Unstable neurologic status (pertussis)
- History of thrombocytopenia (MMR)
- Need to do TB skin test (MMR)

Questions?

Figure 1. Recommended immunization schedule for persons aged 0 through 18 years – United States, 2014.

FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE (FIGURE 2).

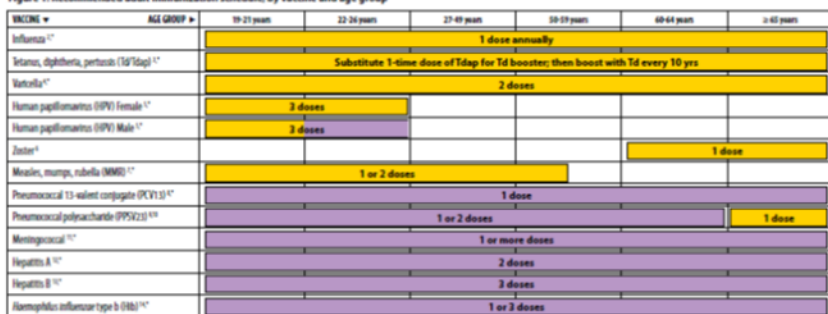
These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are in bold.



Recommended Adult Immunization Schedule—United States - 2014

Note: These recommendations must be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

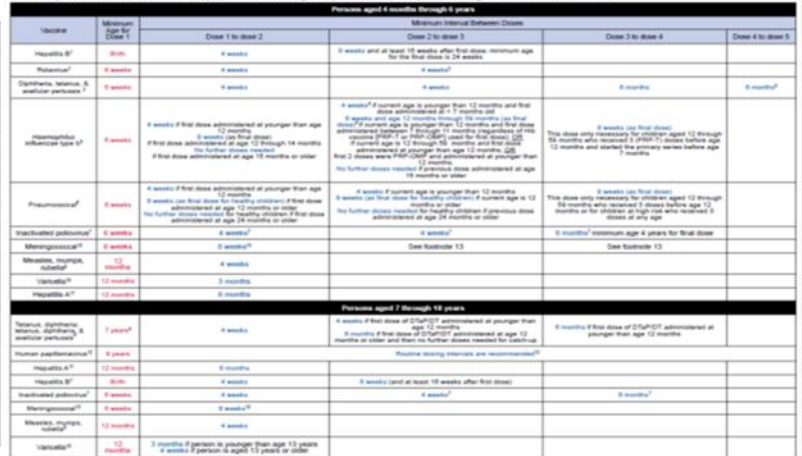
Figure 1. Recommended adult immunization schedule, by vaccine and age group¹



¹Covered by the Vaccine Injury Compensation Program

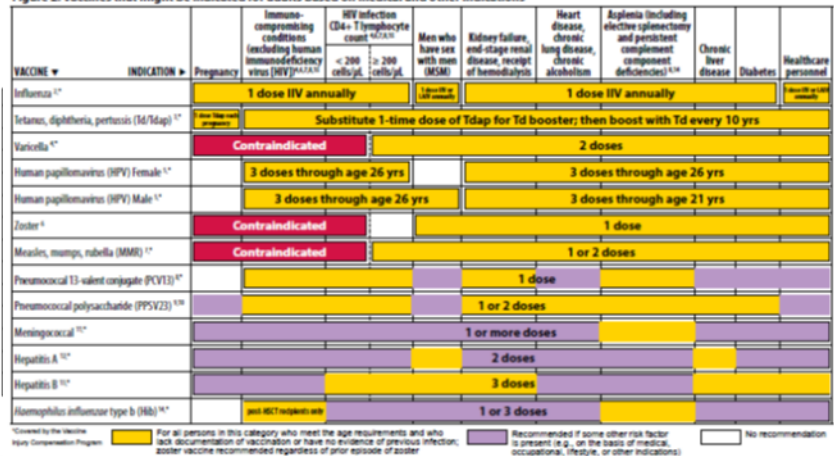
FIGURE 2. Catch-up immunization schedule for persons aged 4 months through 18 years who start late or who are more than 1 month behind – United States, 2014.

The figure below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. Always use this table in conjunction with Figure 1 and the footnotes that follow.



NOTE: The above recommendations must be read along with the footnotes of this schedule.

Figure 2. Vaccines that might be indicated for adults based on medical and other indications¹



¹Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection, zoster vaccine recommended regardless of prior episode of shingles. Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications). No recommendation.

<http://www.cdc.gov/vaccines/schedules/index.html>

azdhs.gov



Health and Wellness for all Arizonans

